# EXHIBIT 1

The STAMP brush can be used to stick down a cut-out repeatedly and at selected angles and magnification.

A second image is saved on the buffer store can be selectively restored through the original picture using an airbrush, chalk or a paintbrush.

INTING	paint	wash	magnify		DRAW STEN	USE STENCIL
APHICS	chalk	shade			save picsten	display sten
FECTS	airbrush	special			old new	reverse sten
STEUP	100%	blur			wipe pic	USE GRID
IMATION		smooth	restore		restore pic	
RARY		crisp	field	1 2		

by Bob Pank, Quantel
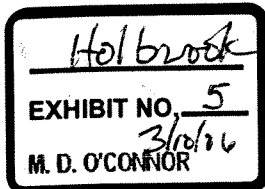
PAINTING	cut	flip	stamp	sten only	DRAW STEN	USE S
GRAPHICS	paste	tumble	smudge	xpos 406	save picsten	display
EFFECTS	smear	rotate 90	spacing	ypos −49	old new	revers
PASTEUP	100%	original		angle 349	wipe pic	USE G
ANIMATION				magn 40	restore pic	
LIBRARY	library			x 100 y 100		

PAINTBOX What's New

The Quantel Paintbox was launched five years ago into a market which hardly knew what a TV graphics machine could do. Then, as now, other machines were mostly computer based rather than dedicated tools. Having steered people away from concepts of computer graphics towards the benefits of a TV graphics system, the Paintbox took off. It is a credit to its design that there have been no major system changes to the Paintbox since then. Nearly all the long list of enhancements have come in the form of software so all users can benefit. Some external evolutionary changes have occurred such as the introduction of the removeable disk system (RSD) and a new touch tablet from TDS. The software has changed it quite dramatically, almost into a new machine.

The success of the Paintbox is simply related to the ease with which graphics designers can explore its many facets to produce high quality graphics efficiently. Software changes have been made always to enhance this situation and we are forever grateful for the useful comments, pointers, and hints that designers give us. Where would we be without our enthusiastic customers? Designers were in at the start of Paintbox and our continued good

relationship with them ensures the future for all concerned.

Over the last 15 months there have been two major software releases, PRO4, and the latest, PRO4.06. The first, besides bringing a host of new features, significantly changed the layout of the menus. The second has introduced a further new range of facilities and enhancements.

The new on-screen menu layout of PRO4 follows the same theme as the previous software versions with the major modes displayed at the left and the relevant subordinate functions appearing to the right. In this way the menus are kept uncluttered despite the fact that there are over 300 functions available in all. Stencil functions are made available in all menus except Library. This is simply because the stencil is such an important and widely used facility that making it so easily available simplifies and speeds operation.

The initial concept of the Paintbox was that it should completely hide the 'digital' and 'computer' technology from the user so the artist can concentrate on creative matters. PRO4 introduced something of a departure from the idea with PASTATS. This shows the figures which define the x and y position, magnification and rotation of a cutout. Conversely the figures can be used to force the cutout to a particular size, position or rota-

tion. This has proved very useful for a range of applications including making animation sequences.

Further help towards frame animation is given in facilities Auto Save and Auto Fetch. Auto Save freezes and records frames in an automatically numbered sequence. Playing out Auto Fetch presents pictures in numeric sequence on pen tap or cue. A simple protocol exists to enable these functions to operate in conjunction with a VTR via an animation controller such as the Lyon Lamb or VES. With such a setup, video clips can be automatically loaded into Paintbox, retouched or whatever in the usual Paintbox way, and re-recorded frame by frame back on to tape again using the Auto Fetch. The system works well but is of course superseded if you have a Harry.

The concept of 'special' brushes is introduced. Blur and Crisp do not paint but are extremely useful for defocusing or sharpening an area of picture and are just right for emphasising a particular item or the depth of the picture. The field brush allows the selection of picture information from only one of the two TV fields, thus removing interfield motion flicker in the brushed area.

PRO4 brought a number of other functions such as TACK which enables any

number of cutouts to be moved around and repositioned before being finally stuck; for convenience, stencil can be shown as any colour rather than the normal red. Perspective is a feature which is particularly useful for package designers, enabling pictures and labels to be stuck on to the sides of the package in a realistic way. Also there is the ability to show the stencil in any colour.

The latest Paintbox addition is PRO4.06 software. Not a particularly auspicious name for what is a very significant advance in Paintbox capabilities. The original PRO4 menu system is maintained but is streamlined and offers many new possibilities. It also represents a cross fertilisation of ideas with the Graphic Paintbox being supplied to the print industry.

One major area is additional facilities for the use of cutouts. Stamp gives a quick way of repeating a cutout many times. Smudge uses the outline of the cutout to define the parts of the picture to be moved by the pen strokes and is very much analogous to the wet finger on a wet painting. It has already been proved easy to modify a digitised photo in this way so that, within a few minutes, it look like a painting. Add a canvas texture and just hang it on the wall! Smear sticks the contents of the cutout as it is dragged across the picture. This instantly produces a trail effect and can be used as a custom brush. As a final twist, the percentage of Smudge, Smear and Stamp intensity can be set anywhere between 1 and 100 using a number box that first appeared to enable pre-setting of the flow rate of the air brush. Artists comment that these features provide a totally new way of using the Paintbox.

There are now two temporary save pictures files called Old and New. A new special brush, Restore, enables painting from the existing picture through to the selected Old or New image.

All normal brushes, including airbrush, can be used. Besides giving an easy way to fix a mistake without having to lose all the work since the last save picture operation (you restore only the particular area of the error), Restore has become very popular for a host of other uses. For example brushed 'wipes' from one picture to another, blending of two images (or more if you like), defining an irregular area for an effect such as mosaic, and so on. As with so many of the Paintbox functions, the graphics designers are forever experimenting and coming up with new techniques and applications. Not surprising really; that's what the Paintbox is all about.

There are many very helpful practical enhancements. For instance Effects (mosiac, overlay, field and colour map) can be limited to a chosen rectangle and can be restricted by stencil. Rework enables cutouts to be recalled with their full stencil and chosen picture area for reworking. Library items are identified by title during Browse. If the original item is to be recalled after further work, the artist simply reopens the library and hits the title. Another feature allows the overlay range to be set by defining luminance levels for

PAINTING	paint	wash	magnify	DRAW STEN	inc	dec		
GRAPHICS	chalk	shade		save picsten				
EFFECTS	airbrush	special		old	new	7	8	9	←
PASTEUP	100%			wipe pic	4	5	6	→
ANIMATION				restore pic	1	2	3	−
LIBRARY						0		C

The flow of paint from the airbrush can be selected from 1% to 100%.

PAINTING	lines	solid	magnify	DRAW STEN	USE STENCIL
GRAPHICS		grad		save picsten	display sten
EFFECTS	circles	square		old new	reverse sten
PASTEUP	ellipses			wipe pic	USE GRID
ANIMATION	fill			restore pic	
LIBRARY	define grid	100% airbrush			

During selection of facilities, the current state of the brush is displayed in the blue box.

the opaque and transparent ends of the stencil. Although the initial idea was that this would enable a good overlay to be derived from a low contrast picture, this has also been found most effective as a quick way of defining a stencil of a particular object in a picture.

Following the success of Pastats, the theme has been extended, enhanced and renamed Statistics. The parameter values can now be displayed on the menu and these include separate controls for x and y magnification — so aspect ratios can be changed. Numeric entries into the menu are becoming more commonplace and so a number pad has been provided at the right of the menu. It means that there is less need to refer to the keyboard and joystick. Once again, the controls in the hands of creative minds start to be used in unanticipated ways. For example, controlling position with the number pad using the INC(rement) box precisely 'nudges' the cutout across the screen ... enter new nudge feature!

Frame grabbing has been improved with the introduction of frame averaging. Besides taking in just one frame as before, a two-frame average can be chosen. This has the benefit of eliminating cross colour from coded sources and reducing random noise. For more troublesome inputs, the MANY box allows a new average to be made each time the pen is tapped. So, provided the image holds still, noise can be greatly reduced. But, once again, the creative people have already found an artistic application. Placing artwork under the camera and taking many picture averages as the camera zooms produces an exciting motion blur effect. To finish the work, take in the final zoomed out image and use the restore brush to add it over the blur. Another masterpiece completed.

Typography has not stood still either. The original library of 100 off-the-shelf typefaces has expanded to 140. More are being added on a regular basis as selections are made from the thousands of faces available.

Interfacing

On the technical side, more interfaces have been provided. Perhaps the most important is the 4:2:2 component digital video and control interface with Quantel's Harry. This interface is so well developed that, when required, the two machines behave as one. Designers become almost unaware of which machine they are using. Is Harry an extension of Paintbox or Paintbox an extension of Harry? It really doesn't matter because control and picture exchange is so easy that one simply complements the other. It is rare, if ever, that such close machine to machine integration has been seen in TV post production. And yet, the two can now be split to work completely independantly and so retain full flexibility.

Another important interface is given by the microfloppy disk. This can hold one picture, or cutout and provides a picture in a format which can be used for interface to other digital machines such as graphics computers. It also gives a means of picture exchange with the Graphics Paintbox for producing TV viewer guides or translating image from television advertising campaigns to co-ordinated advertisements in printed media.

Remote control software now allows the Paintbox to be totally controlled from an RS-232 port. This is particularly useful for fixed format presentations such as weather forecasts, special events, elections, sports and so on. This 'remote' Paintbox can also be switched to normal touch tablet operation.   **IBE 104**